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The Amateur Radio

COMMUNICATOR

JANUARY/FEBRUARY 1993 FOR THE NOVICE AND TECHNICIAN AMATEUR Volume 3 Number 1

- The NARA-WUSA-50 Award
- Starting Out On Simplex
- FCC Rules
- Traffic Handling
- Teaching The Teachers

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ON THE COVER

Old-timers will remember the glow of mercury vapor rectifier tubes and reminisce over the flickering blue light from 866s in a high-power amplitude modulated transmitter. Today the soft glow has been replaced by the hard metal of a silicon rectifier. Thanks to modern technology the only flashing and flickering comes from light-emitting diodes or liquid-crystal computer displays. Another era fades to black like an extinguished filament.

The Amateur Radio Communicator

The Amateur Radio Communicator is published bi-monthly and is the official journal of the National Amateur Radio Association (NARA), P.O. Box 598, Redmond, WA 98073-0598.

The National Amateur Radio Association is incorporated in the State of Washington and is a non-profit organization as defined in Section 501(c)(3) of the Internal Revenue Service Code.

Organization Goals

The broad goal of NARA is to publicize Amateur Radio and to encourage people to become Amateurs by earning an entry level Novice or Technician Class license.

The organization has five specific goals within this broad framework. These are to a) publicize Amateur Radio to the general public, b) attract young people to the Amateur Radio Service, c) increase the stature and benefits of the Novice and Technician Class licenses, d) represent the interests of Novice and Technician Class Amateurs at the national level and e) make all Amateurs aware that our radio frequencies are in jeopardy from commercial interests. More specifically:

A. NARA advertises in various consumer publications to create public awareness of the Amateur Radio Service.

B. NARA is specifically interested in encouraging young people to join our fraternity. A core of young people insures growth of the Amateur Radio Service.

C. NARA believes that the Novice and Technician classes are important and respected entry level licenses into the Amateur Radio fraternity. We are committed to increasing its benefits and stature in the Amateur Radio community.

D. NARA is committed to representing the interests of all Novice and Technician Class Amateurs at the national level. We continue to review information from the Federal Communications Commission and submit material to them with the Novice and Technician perspective in mind.

E. Finally, NARA is very concerned that confiscation of frequencies assigned to the Amateur Radio Service will continue. NARA is committed to obtaining new spectrum for the continued growth in numbers of Novice and Technician Class Amateurs.

Membership and Subscriptions

Those joining NARA receive a subscription to *The Amateur Radio Communicator* for a period of one year. The combined cost of membership and magazine is $10.00 per year in all areas with a U.S. ZIP code.

The NARA membership and subscription to *The Amateur Radio Communicator* cannot be separated.

It is not necessary to hold an Amateur Radio license to become a member of the National Amateur Radio Association. The only "qualification" is an interest in radio communications.

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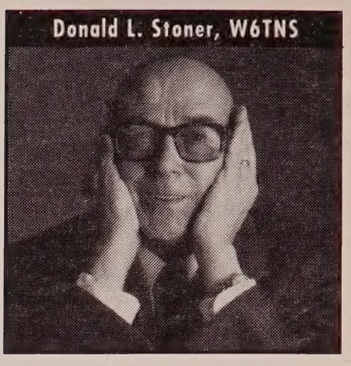


OK - So I Was Wrong—Twice!

by Don Stoner, W6TNS

NOW THAT 1992 has come and gone, the time has arrived to tidy up my thoughts and opinions for the new year. Most people make resolutions—not me. This is the time of the year I admit my mistakes for the previous year. This is a banner year. You are seeing history in the making. I made *two mistakes* last year!

MISTAKE 1 - ADVERTISING

Those of you who receive our member publication regularly may have been surprised to see advertising in the November/December issue. Since the first issue, I've thought that *The Amateur Radio Communicator* should be free of advertising. This way I would be independent and free to criticize a manufacturer, without worrying about financial repercussion. But in the two years or so that the *Communicator* has been in existence, there has been nothing to criticize. Also, I've come to realize that Amateurs *and potential Amateurs* like to compare products and specifications before making a buying decision.

So what's to be independent about? The ham radio manufacturing industry does a fantastic job providing our fraternity with reliable, low-cost products. It is a competitive business and each manufacturer tries to outdo the other in making a more desirable "widget." Amateurs are the beneficiaries of this competition.

Like all magazine editors, I'd like to ask you to support the advertisers in our publication. They supported NARA when we needed them and I want you to say thank you. If you are torn between similar products, and don't know which to purchase—make your decision based on who supports the National Amateur Radio Association!

And a word to those of you in the ham radio industry. The National Amateur Radio Association is the **only national organization devoted strictly to the beginner** and those who would like to join our fraternity. Newcomers are anxious for information on ham radio and the products used by Amateurs. Not only do we send complimentary copies to schools and general inquires but **every new ham** gets a copy of *The Amateur Radio Communicator*.

> Most people make resolutions—not me. This is the time of the year I admit my mistakes for the previous year.

If you want to make sure that new hams and "wannabes" see your product, contact our Advertising Manager, Karen Dixon at (206)868-3844. So much for mistake one.

MISTAKE TWO - THE MEATHEADS

Since our first issue, I've been reluctant to say anything bad about my fellow hams. Beginning hams would learn soon enough that we have some bad apples in our electronic barrel. So in theory, if I didn't say anything about these "meatheads," newcomers would not be discouraged from joining our hobby.

I was wrong. Many youngsters hear these creeps long before a strong interest in ham radio can develop. They have a scanner and swish, it trips across some spectrum called the two-meter band. Plink, plink, plink, snap and it locks on the infamous .435 repeater in Los Angeles. Our young friend is suddenly subjected to the most unimaginable filth that makes Howard Stern seem like a girl scout.

We work diligently at the National Amateur Radio Association to interest people in becoming hams. Then one of these cretins comes along and manages to undo all our efforts. Who in their right mind would want to be a ham after listening to .435 for a few moments?

Now that they are able to levy significant monetary forfeitures, the Federal Communications Commission (FCC) has taken on a new militancy. Those of you who have enjoyed poking sticks at the tiger better keep one eye over your shoulder! You can no longer ignore the FCC Rules and Regulations with impunity 'cause they gonna getcha!

A regular feature in the *Amateur*

Radio Communicator will be notices about those who have broken the rules. Maybe if we publicize these intentional transgressors, hams will be less inclined to flout their "individuality."

A few additional words about the FCC are in order at this point. Back when I was WN6TNS, the only deterrent the FCC had was the famous phrase, "$10,000 or ten years." I never knew anyone who had paid the ultimate price, but I had no doubt they could back up the threat. I did not fear the FCC (nor should you) but I certainly respected them (as you should also). Like the great majority of hams, I conducted myself with pride in my license and I never received an FCC citation commonly referred to as a "pink ticket" (are they still pink?)

Things really have changed since those days, haven't they? My dad taught me that you didn't talk about sex, religion or politics on ham radio. These days whenever that thought is expressed, someone usually says that hams are boring if all they talk about is the weather, their station and so on. Well, it's not so unless you happen to be a small-minded person whose total sphere of knowledge is sex, religion and politics! In my 40 years as a ham, I have made friends all over the world, have helped two hams immigrate to this country, earned lots of awards, and helped thousands to join the ranks of ham radio. Every one of the successes in my career have roots in ham radio and the curiosity in things electronic that my dad instilled in me. I am living proof that Part 97.1 of the Rules and Regulations works. And I managed all this without talking about sex, religion and politics on the air.

Even so, I still make mistakes. I made two last year, but in my opinion this editorial wipes the slate clean.

73 Don, W6TNS ❑

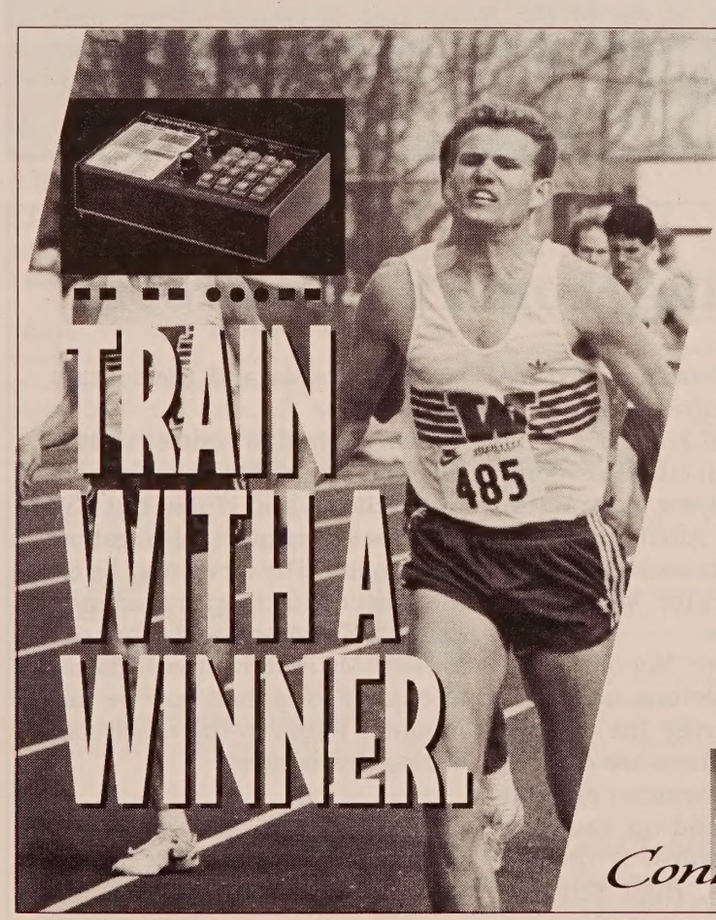
HOT TIPS

Videotapes are a great way to learn more about ham radio and the industry. They work wonderfully in classrooms and radio clubs for visual presentations and make a great additiion to every ham's library of materials.

NARA currently offers seven different videotapes to choose from, (see the ad in the back of this publication). For more information and a brochure simply phone #1-800-GOT-2-HAM!

WE APOLOGIZE

In the Nov/Dec 1992 issue of the *Communicator* in the *How To Get Started In Satellites* article we incorrectly listed the "Beacon Frequency" in *Figure 1* as 29.337. It should have been 29.357 MHZ. Sorry for the confusion. — NARA Staff



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Connect with us

THE FUTURE OF OUR HOBBY

Did you know that space shuttle Apollo Condor lifted off at 10:35 AM on May 11, 1992, from Wausau, Wisconsin?

Space shuttle Apollo Condor? That's right, but this space shuttle wasn't manned by NASA astronauts. Instead, the crew consisted of a teacher and sixth-grade students from the Wausau School District.

Although this shuttle will never leave the ground, it will provide students with a unique opportunity to learn more about science and the space program. Following lift-off, **the shuttle travels to all 13 elementary schools in the school district to teach students about the space program.**

"Dream Flight Wausau" was the idea of Sharon Ryan, a Wausau elementary school teacher who was named "1991 Elementary School Teacher of the Year" in Wisconsin. Frederick Prehn, WX9W, is coordinating the communications part of the mission under the auspices of the Wisconsin Valley Amateur Radio Association.

More than 35 Amateur Radio operators volunteered their vacation time to make this project happen. In addition, several leading equipment manufacturers donated transceivers, antennas and other products to make mission control as realistic as possible.

Communications between the shuttle and mission control were heard in the Wausau area on 146.64 and 444.1 MHz. People throughout the country monitored the transmissions on 14.275 and 28.400 MHz.

Several modes of Amateur Radio communications were used, including packet radio and Amateur television, (ATV). A local cable TV company in Wausau relayed the ATV signals on channel 29 to schools.

This was a great opportunity to publicize ham radio and create interest in young people for science and space. As a result of his work, Fred Prehn, WX9W, received the 1992 Advanced Electronic Applications "AEA Amateur Ambassador" award, and received a $1,000 cash award.

A tip of the NARA hat to Sharon Ryan and Fred Prehn for contributing to the future of our hobby! ❑

HOT TIPS

Contesting From The Classroom

During National Vocational Education Week, the second week in February, The School Club Round-up will take place and over 30 schools will participate. The 1993 School Club Round-up will be the week of February 8-12.

The Council for the Advancement of Amateur Radio in the New York City School sponsors the School Club Round-up. Lew Malchick, N2RQ, Brooklyn Technical High School is the contest coordinator.

The Tektrons Amateur Radio Club's students will be tuned-in to the entire world, learning geography on a continuing need-to-know basis and pinpointing the locations of cities and countries on a world map located in our classroom. My classes are studying electronics, math, speech, and Amateur Radio. Tektrons are a high school club at Sno-Isle Skills Center located in Everett, Washington.

The rules of the School Club Round-up allow only one transmitter to be used during the second week of February. There are no provisions for multi-transmitter class in the School Club Round-up. But, this school year, the contest is divided into three divisions, High Schools, Middle Schools and Elementary Schools.

Scoring in this contest is with the highest points for contacts with schools and clubs, but CW and packet contact also gather high points. The focus may be on the most contacts with students, clubs, DX stations and other operators. My Radio Active Kids are also going to explain how we use Amateur Radio in the classroom during this contest.

Thanks to - Larry Luchi, W7KZE

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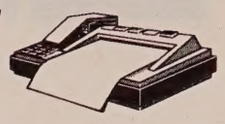

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1000 Channels

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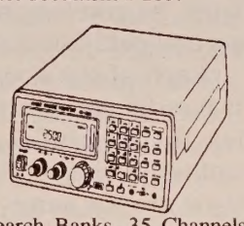
AR2500
$429.00
2016 Channels
1 to 1300MHz
Computer Control



62 Scan Banks, 16 Search Banks, 35 Channels per second. Computer control for logging and spectrum display. AM, NFM, WFM, & BFO for CW/SSB. Priority bank, delay/hold and selectable search increments. Permanent memory. DC or AC with adaptors. Mtng Brkt & Antenna included. Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb. Fax fact # 305

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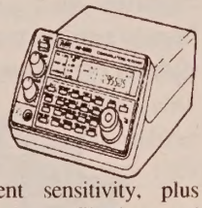
400 Channels
100KHz to 2036MHz



Extreme coverage, excellent sensitivity, plus processor controlled band pass filtering and attenuation to eliminate interference. Top rated receiver in its class, offers AM, NFM Wide FM, LSB, USB, CW modes. RS232 control. Lockout in search. 4 priority channels. Delay & hold & Freescan modes. AC/DC pwr cord and whip ant. included. Size: 3 1/7H x 5 2/5W x 7 7/8D. Wt 2lbs., 10oz. Fax fact document #105.

Free Stuff

Demo disk of SCS (scanner control system) software for AR 3000 & AR2500. Call toll free to order. Also, Free with AR2500: Control software, a $49.95 value. Allocation chart of all voice frequencies. Dial Fax Facts for doc. #999.

Mobile Scanners

Bearcat 760XLTM
$249.95
100 Channel
800 MHz

Five banks of 20 channels each. Covers 29-54, 118-174, 406-512 and 806-954MHz (with cell lock). Features scan, search, delay, priority, memory backup, lockout, service search, & keylock. Includes AC/DC cords, mtng brkt, antenna. Size: 4 3/8 x 6 15/16 x 1 5/8. Wt: 4.5lbs. Fax fact document #550.

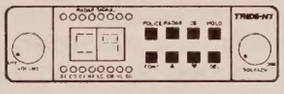
Bearcat 590XLTX
$199.95
100 Channel
11 Band

Five banks of 20 channels each. Covers 29-54, 118-174, and 406-512MHz. Features scan, search, delay, priority, memory backup, lockout, service search, & keylock. Includes AC/DC cords, mtng brkt, antenna. Size: 7 3/8 x 6 15/16 x 1 5/8. Wt: 4.1lbs. Fax fact document #570.

Bearcat 560XLTZ
$99.95
16 Channel
10 Band

Compact, digital programmable unit covers 29-54, 136-174, and 406-512MHz. Features scan, WX search, delay, priority, memory backup, lockout, review,& auto delay. Includes AC/DC cords, mtng brkt, antenna. Size: 7 3/8 x 2 1/2 x 1 5/8. Wt: 2.5lbs. Fax fact document #560.

Trident TR-2C
$69.95



Scan/CB. Optional laser/wide radar
Scans pre-programmed by state channels in low, high, UHF & T bands. Weather, 40 ch. CB receive plus mobile relay. Size: 5 5/8 x 4 7/8 x 1 3/4. Wt: 1.5lbs. Fax fact document #580.

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Five scan banks 5 search banks. Covers 29-54, 118-174, 406-512 and 830-950 MHz (no cell lock). Features scan, search, delay, priority, permanent memory, lockout, backlite, & keylock. Includes AC/DC adaptor, belt clip, antennas. Size: 5 3/4H x 2W x 1 1/2D. Wt: 12oz.. Fax fact document #650.

Bearcat 200XLTN
$229.95 200 Channels 800 MHz

Ten scan banks plus search. Covers 29-54, 118-174, 406-512 and 806 956MHz (with cell lock). Features scan, search, delay, 10 priorities, mem backup, lockout, WX search, & keylock. Includes NiCad & Chrgr. Size: 1 3/8 x 2 11/16 x 7 1/2. Wt. 32 oz. Fax Facts # 450

Bearcat 100XLTN Now $159.95
100 Channels, Keyboard Programmable.
Similar to 200XLTN above without 800MHz. Fax facts #460

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20 Channels Keyboard Programmable.
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Bearcat 147XLJ Now $89.95
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INTRODUCING!

The NARA WUSA-50 AWARD

HERE WE GO AGAIN—THE introduction of yet another exciting award series by NARA! This time, we're delighted to present NARA's **Worked-the-USA (WUSA)** certificate, plaque, and endorsement sticker program. Just like the other award series that we've introduced, this award is obtainable by *all* classes of licensee, Novice through Amateur Extra. Even Short Wave Listeners are eligible!

As you likely know by now, many Amateur Radio organizations make available a number of "Worked All States" type awards and certificates. But we believe you'll be happy to find that the design of this one is purposefully different, because of the flexibility built into the grand scheme of things. With the **NARA-WUSA-50 Award**, you the applicant, can start out gradually, earn a basic award, and then apply for subsequent certificates, endorsement stickers, or even the ultimate **NARA-WUSA-50 plaque**.

Hmmm. Suddenly we hear sounds of "Alright, already; quit your stalling and tell us the details!" OK, OK, we hear you. We're getting to it!

The basic idea is to communicate, and exchange QSL cards with, licensed radio Amateurs in as many different states as you can. Ten will do for a start, and will qualify you for the first certificate, assuming that you can prove to the NARA Awards Committee that you have indeed confirmed those contacts. "Uh-oh!", you say? "What kind of hoops do I have to jump through to make you realize that I've done what you're asking?" "Simple" we say; just send us photocopies of the appropriate confirming QSL cards that you've collected. There's no formal application required (we *hate* bureaucracy), but be sure to tell us the award you're applying for, NARA has a bundle of them—and many more are on the way.

Whatever you do, do **NOT** send us your original (aka *valuable*) QSL cards. Copies will do nicely, thanks. We don't think you should entrust the postal system with your QSL cards, and we don't want you to have to incur the expense of getting them to us, nor ours getting them back to you. That's why copies make the best sense.

Licensed Amateurs and SWLs alike will find this award series to be flexible, fun, and—if you choose—slightly demanding as well. The choice is yours, you see. Let's take some examples to prove the point:

1. Novice class licensee KA7XYZ decides that she wants to apply for the **NARA-WUSA-50 Award**, based on 10 RTTY (or Morse, SSB, Amtor . . .) contacts with 10 different states that she has QSL card confirmations for. She applies for the basic certificate, and a gold-foil sticker for RTTY. Yes, we'll endorse for any single mode if you like. **We're flexible!**

2. SWL Bob Adams has heard conversations between Amateurs in 30 different states—and he has their QSL cards to prove it. Bob can apply for the basic certificate and not one, but two of the beautiful gold-foil endorsement stickers to boot. Because, in the case of the **NARA-WUSA-50 Award**, stickers are available in increments of 10 states each, in addition to mode endorsements.

3. Advanced class licensee KA2ABC has a *bunch* of QSL cards in his collection, and of late, he's been particularly interested—and active in—packet radio. 'ABC recalls that the NARA Awards Committee is flexible, and wonders if contacts made via store-and-forward packet-bulletin boards would count. He applies, and lo and behold, two weeks later, he receives his certificate and several gold-foil stickers.

Each of the above-mentioned active radio people might have applied for the beautiful **NARA-WUSA-50** walnut plaque as well. The qualifications are the same as the certificate; the only difference being how much pride each of them wants to hang up there on his or her wall!

Stay tuned right here in NARA's *Amateur Radio Communicator* for more exciting Awards Program certificates and plaques. And if you'd like to see us implement a particular Award Program, just say the word. ❑

NARA AWARDS PROGRAM

AVAILABLE AWARDS:

QRP-25 AWARD
25 contacts using five watts or less

PR-1000 AWARD
Five or more public relations/media use

OSCAR-10 AWARD
10 or more contacts utilizing Oscar satellites

RS10-1000 AWARD
Five or more contacts via RS10 satellite

WUSA-50 AWARD
10 or more different states contacts, up to 50

You Can Listen To Russian Telephone Calls

by Don Stoner, W6TNS

NORMALLY *THE Communicator* would not be considered a short-wave listener (SWL) publication. However, there's a synergy between SWLing and ham radio. In fact, many hams had their interest stimulated by listening to the shortwave bands.

But when something unusual comes along, I want to tell our members and readers about it. I have to preface the material that follows by saying that I have not SWL'ed the Russian Satellites myself. The information in this article was supplied to me by Joe Leikhim and Andy Hardy (yep, that's his name), VK3JJH from the land down under.

In previous issues, we've discussed the Russian COSMOS satellites that carry Amateur Radio transponders. These are polar orbit satellites that are in circular orbits and whip around the earth every 105 minutes or so.

The Russians have another satellite called the Molniya. These satellites are in a highly elliptical orbit and used for relaying television transmissions all over Russia and the countries that made up the former Soviet Union.

Since much of Russia is at the northern latitudes, and covers so many time zones, the use of satellites in geosynchronous orbit is not practical. Rather, Russia uses three Molniya satellites in a simultaneous orbit. The perigee of the "egg" is about 35,000km over the Hudson Bay in Canada. When one Molniya is high over Canada, another one is descending over the South Pacific and a third one is rising over India. The point being that at least one Molniya is visible to all points in Russia at any given time. At each TV station, an antenna is used that tracks the rise and fall of each Molniya.

For many hours a day, we can also receive the Molniya virtually anywhere in the United States. According to Joe Leikhim, you can receive Russian language telephone conversations by tuning your receiver between 254.0875 and 254.1125, as well as 266.8375 and 266.9625 MHz. The transmissions are narrow-band FM and are not scrambled. He reports the signals are relayed through the Molniya on a secondary basis and sound like they utilize a crude form of in-band rotary dial signaling.

Joe uses an R9000 receiver, a GasFet preamp tuned to 266 MHz and a six-turn, right-hand, circularly-polarized helical antenna. By the way, Joe lives near Biscayne Bay in Miami so he is in the southern latitudes of the country. He reports full quieting FM reception.

Andy, VK3JJH, chimed in on the EMAIL conversation. He says you should be able to also receive their television program with a little extra effort. The former USSR is still a sub-partner to the European Broadcasting Union (EBU). Their technical standards must, to some degree conform to the rest of Western Europe in order to reduce mutual interference. The standard they use is called SECAM at 625 lines and 50 frames per second. Andy feels that an American domestic black and white set should be easily converted to "pull in" the SECAM transmissions if the vertical and horizontal sweep speeds are adjusted to the SECAM rate (15.42 kHz and 50 Hz). The satellite transmission frequency is in the 900-950 MHz band. is not a spread transmission such as received from our geosynchronous orbit satellites. Apparently it is a standard SECAM television transmission.

If you are lucky you should get a fair to good black and white picture. Note the audio is also higher in frequency and it is usually wide-band FM, but not always—good luck SWLing the Molnyia.

73 Don, W6TNS ❑

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Carole Perry, WB2MGP

Teaching The Teachers

by Carole Perry, WB2MGP

AFTER TEACHING "Introduction To Amateur Radio" to 6, 7, and 8 graders at Intermediate School 72 in Staten Island, New York for the past 12 years, I have been successful in getting only a few of the other teachers involved with Amateur Radio. In fact, most of my colleagues slow down as they approach my room to better hear the "exotic" sounds coming from the radio room; but then quickly pick up their pace for fear of being invited to come in and talk on the air.

Finally, a unique opportunity arose last term. As part of a Professional Growth project in my school district, I was selected to conduct a two-part workshop on Amateur Radio. The course was to be taught to other teachers in my school who were interested in learning more about the hobby, and how to incorporate it into their own curricula. Here at last, was what I had been waiting for.

Most of the other teachers in my school are aware of the tremendous enthusiasm amongst the students who are in the ham radio program. Now was my chance to explain what ham radio is all about on an appropriate level, and to demonstrate just how applicable the hobby could be to different subject areas.

Having this impressive assemblage of teachers in my room really motivated me to give this a good shot! I prepared individual lesson plans in each of their subject areas. Every teacher was given a personally prepared lesson applicable to their own discipline. They loved the high-motivational approach that was suggested through the use of Amateur Radio.

Carole Perry, WB2MGP, with a group of her students. Aaron, Tammy and Yaniv are encouraging Kenny, KB2FGV, on the 10 meter CQ All Schools network.

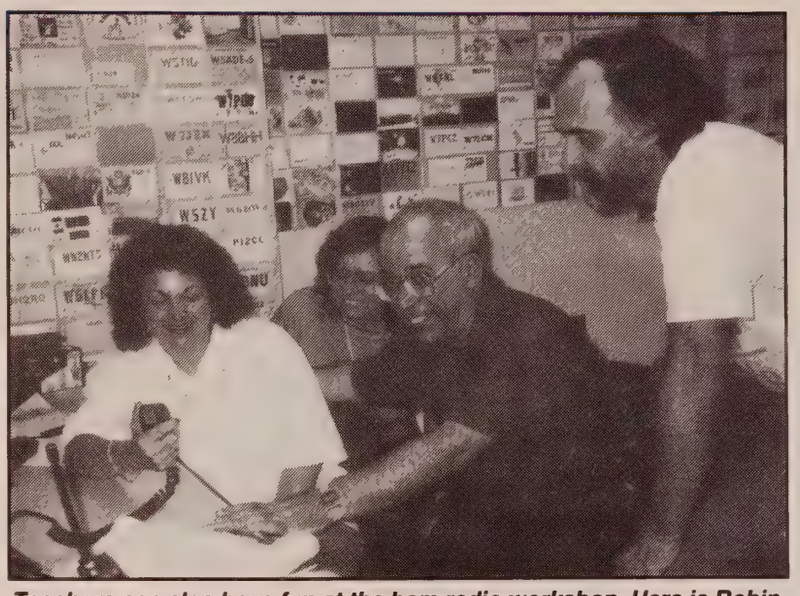
I had several interesting ham friends standing by on 2 and 10 meters to help with live radio demonstrations. At first, no one volunteered to come to the microphone. So I carried on in an animated fashion with my friends on the air so that the other teachers could see how much fun it could be. Of course, all my ham friends were quick to welcome everyone and to encourage them to get on the radio.

Sure enough, one brave person, Larry Orange, a social studies teacher volunteered to get on the air. He was simply terrific! The rest of us applauded the way he jumped right into it with some encouragement from the very friendly hams he was speaking with. Larry even had fun giving his name phonetically as he read the letters off of a chart that one of the kids had made.

By the time we got to the second session, most of the teachers were

much more comfortable with the room, the materials, and the radio. I soon had no problem getting most of them on the air. They really had no idea how much fun it could be.

I showed them several videos to provide an overview of the different aspects of Amateur Radio. They were impressed and excited about the possibilities. I offered to do a demo lesson in each of their classes sometime during the term. We set up schedules; for example, I could take a social studies class when that teacher was ready to introduce a new region of the country or a new area of the world. I've done some of these exchange lessons in the past, and they've always been highly successful. The teachers see the advantage of giving high-motivational lessons on the radio instead of telling the class to simply turn to a page in a book. That can't possibly compare with a lively conversation with a citizen from another country.



Teachers can also have fun at the ham radio workshop. Here is Robin Gerstel, Special Education teacher, on the microphone, along with Theo Zalantis, Language Arts, Larry Orange, Social Studies teacher and Bill Flick, Art teacher.

Teaching teachers about something as dynamic as ham radio in a classroom is a very rewarding experience that benefits countless children in the long run!

I was particularly delighted to hear that the special education teacher thought she could do lots of creative lessons with her students with the code practice oscillators I use in my program. (See the ad in this publication.) She immediately related to the obvious manual dexterity and auditory skills that could be reinforced. Using Morse Code in the classroom is an excellent way to teach these important skills. Nobody bothers to teach children how to listen and how to concentrate. Using the little oscillators is a fun way to teach kids.

The language arts teachers saw the clever way I got their curricula tied into my radio material. What better way to learn the proper way to write a letter than to actually write one to someone you just spoke with on the radio? The follow-up with QSL cards is always a fun activity. The children are always very exacting about how they fill the cards out. Learning how to speak clearly and succinctly on the radio is also a terrific communications skill.

In our school, there are over 56 different languages and dialects being spoken. We have a full-time ESL (English as a second language) teacher on staff. Peggy Koustantonis was one of the teachers who attended my seminar to learn some methods of teaching youngsters. She saw how ham radio could be used with students who don't speak English and are shy about talking to the other children.

As a culminating activity, I had each teacher write a brief outline of how he or she planned to incorporate at least one idea obtained from the workshop into their classroom that month. I loved the fact that not one person hesitated for a minute. Every teacher came up with at least an outline of a lesson that utilized ham radio material to give more excitement to a lesson.

After the course, three teachers came back to my room to get more materials about the FCC license exams. To date, two of them are studying for the Novice license. It's a wonderful experience for me to walk down the halls these days and to hear teachers—not students—saying the Morse Code letters aloud to themselves. The kids love all this interest from their teachers too. They have fun offering to help their teachers learn the code.

Teaching teachers about something as dynamic as ham radio in a classroom is a very rewarding experience that benefits countless children in the long run. I strongly encourage this as an adjunct to any radio program in a school. Try it, and write to me about the results you achieve.

Please join me, along with Gordon West, WB6NOA, on the CQ All Schools net every Tuesday and Thursday on 28.303 MHz at 12:30 to 1:30 eastern time.

Also, if you know any articulate, enthusiastic youngsters, (age up to 18), who are interested in participating in national youth forums, please have them get in touch with me. I can be reached at (718) 983-1416 or PO Box 131646, Staten Island, NY 10313-0006.

73 from Carole, WB2MGP ❑

THE • ADVENTURES • OF

Dan & Burke

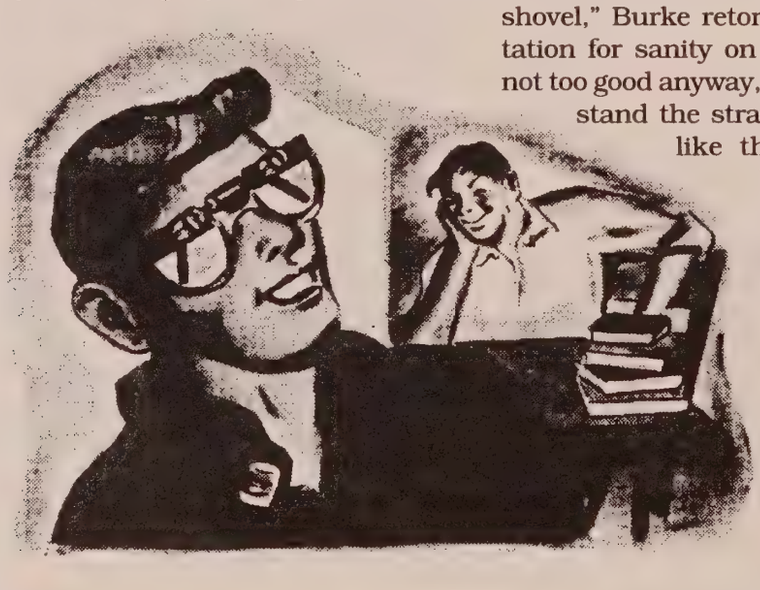
Hello-o-o-o Down There!

A cold November rain beat against the windows of the room Dan and Burke occupied in the H-3 Residence Hall of Parvoo University. Burke was studying alone in the room, but now the door opened and Dan came in wearing a glistening wet yellow slicker. He stood expectantly just inside the door until his buddy turned around in his chair and looked at him curiously.

Dan deserved the curious stare. A rapid squeaking sound like the voice of a bat came from him, and little objects of some sort darted rhythmically back and forth across the lenses of his horn-rimmed glasses.

"What on earth is the matter with your glasses?" Burke demanded.

"Oh, so you noticed my lens-wiper invention," Dan said casually, reaching into his pocket and doing something that stilled the sound and the flickering movement in front of his eyes. "I thought you might not," he added, as he carefully unclipped a spidery mechanism from the heavy frames of his glasses.



"It's really quite simple, something any near-genius could have thought up," he said modestly. "This little PM fractional horsepower d.c. motor drives two reversing screws from the level-wind mechanisms of old fishing reels. A bracket attached to each traveling pawl riding in the screw thread carries the little rubber wiper blades back and forth across the lenses. The whole thing clips to the frame of the glasses, and the battery and switch are carried in my pants pocket. Raindrops don't bother me at all now, and I'm sure snowflakes won't either. It takes a little will power, though, to keep from batting your eyes every time the wiper blades cross in front of them. What do you think?"

"I think you better throw that thing on the floor and let me hit it with a shovel," Burke retorted. "Our reputation for sanity on this campus is not too good anyway, and it will never stand the strain of something like that. You've not been wearing the thing around campus, I hope."

"I was wearing it on plaque patrol down along the river, but if the students and faculty can get used to seeing those seniors sporting their suits and ties, they shouldn't flinch at anything," Dan retorted.

"What kind of patrol were you on?"

"Plaque, spelled p-l-a-q-u-e. Oh, I forgot you didn't know about that. Last night some guys from H-2 stole a big bronze plaque out of our trophy case. Someone spotted them going out the door with it, and a gang of H-3 guys set off in pursuit. The 'thieves' took off in their car with our men in another car right behind them. Finally, they were cornered down along the river; but the plaque was not with them. They had ditched it somewhere."

"The guys from H-3 went over the route the thieves had followed almost inch by inch without finding the plaque," Dan continued, "and it was decided that the jokers must have heaved it into the river that runs parallel to the road for a half mile or so. We're keeping a constant patrol of that stretch to make sure the thieves don't recover the thing before we have a chance to find it. They probably know exactly where they threw it, but we don't. Given a chance, they could sneak in there, fish it out, and be one up on us."

"How do you intend to locate it? A half mile of swollen muddy river is quite a haystack."

"That's what's bugging us. We've messed around some with rakes and grabhooks, but that's pretty discouraging. The thieves were in a convertible, and a guy standing up could have sailed the plaque quite a distance out into the river. If the plaque

lit on its face, there would be a good chance of hooking the wire across the back of it; but the odds are 50/50 it lit on its back in that soft mud at the bottom, and a rake would pass right over it."

"How about diving?" Burke suggested.

"The water is too cold and too muddy. You can't see in more than a couple of inches of the stuff; so you'd just have to feel for the plaque. Remember, it can be anywhere along that half-mile stretch and anywhere from five to seventy-five feet from the bank. Several guys say they will dive for it when we locate it, but they simply can't invite pneumonia searching for it."

"Hm-m-m, it seems we have ourselves a challenging problem. Since the thing is bronze, of course no sort of magnetic detection will work."

"Yeah, we thought of that. I guess what we need is some sort of cheap and dirty sonar."

"Say that again!" Burke exclaimed as his eyes took on their glazed, deep-thought appearance.

"I said I guess we need some sort of cheap and dirty sonar."

"Precisely! And I know exactly where we can get it. Come on. Let's find someone with a car who can drive us to my cousin's about twenty miles east of here."

When you are in your teens, thoughts and concepts come fast and furious. A little more than two hours later Dan and Burke were back in their room checking out a piece of compact electronic gear Burke had wheedled out of his cousin.

"My cousin uses this electronic depth finder on his boat," Burke explained. "He and I were playing around with it on the Tippecanoe River last summer. It's really a simple form of echo-ranging sonar. That's why your remark reminded me of it."

"How does it work?" Dan wanted to know.

"Behind the rim of this circular transparent screen, as you can see now that I've taken the cover off, a motor whirls a neon tube on the end of a radial arm. The circular path of the neon bulb is marked off in feet. See these contacts that close briefly every time the neon bulb passes behind the 'O' mark here at the top of the dial? When they close, they feed a short pulse of 200-Hz signal through a cable to this transducer that's mounted to the boat so it's in the water and pointing downward. The pulse is simultaneously fed through a transistorized amplifier to the neon bulb and makes it flash behind the 'O.'"

"Sound from the transducer travels down to the bottom of the lake or stream, and then is reflected back up into the transducer, that now makes like a microphone instead of a speaker. The resulting electrical pulse feeds through the amplifier to the neon bulb and causes it to flash a second time. Since the neon bulb travels around the face of the dial at a controlled and known speed, the angular rotation between the first and second flashes is a function of the time it takes the sound to go from the transducer to the bottom of the lake and back. The speed of the motor and the markings on the dial are such that the depth of the water is indicated directly in feet by the location of the second flash of light."

"How fast does the motor turn?" Dan asked.

"Let's see; one complete revolution of the neon bulb indicates a maximum depth on this scale of 120 feet. Sound travels through water at about 4800 feet-per-second. A round trip from transducer to bottom and back would be 240 feet, requiring 1/20 second. So-o-o, the motor must be turning at 1200 RPM, and we are taking 20 soundings-per-second. At this frequency you'll notice that the persistence of human vision makes the flashing light seem almost continuous."

"I understand how the thing yells 'Hello-o-o-o-there' at the bottom, and times the echo coming back to see how deep the water is, but I don't seehow it's going to help us much."

"Don't be too sure about that. Put a pillow on the floor and lay that *Sting* CD on top of it."

By the time Dan had done this, Burke had the instrument working; and when he held the transducer a foot or so from the floor, it indicated

Dan & Burke

around five feet. "Get that disgusted look off your face," he told Dan. "Remember that sound travels more than four times as fast in water as it does in air; so the instrument is indicating correctly. Now watch that second light closely as I move the transducer over the end of the pillow and finally pass it directly over the CD."

As the transducer moved over the pillow, the sharply defined echo light became wider and less sharp. Burke reduced the gain of the amplifier until this effect was even more pronounced. However, when the beam of sound reached the CD, the light became much sharper and brighter with the more distinct echo returned from the hard surface of the plastic.

"Fine!" Burke exulted. "It works exactly as I hoped. When my cousin and I were fooling around in the clear water of the Tippecanoe, I noticed that any large rock on the bottom gave a clearer, sharper echo than did mud or soft sand. Results with the record and pillow confirm this. Tomorrow morning we'll hook the thing on a boat and see what we shall see."

It was still raining heavily the next morning, which was Sunday; but that didn't stop the plaque hunters. The depth-finder was installed on a small wooden boat powered by a quiet electric outboard motor. Dan operated the boat; Burke kept watch on the depth-finder; and another boy, Frank, was along to do the diving. Several other guys from H-3 followed along the bank as Dan zigzagged back and forth, slowly moving downstream.

They had been operating less than fifteen minutes when Burke gave a sharp cry: "I'm getting an echo!"

Dan worked the boat back and forth across the spot until he determined that the object at the bottom was about the size of the plaque. Then Frank peeled off his clothes down to his swimming shorts and dove into the muddy water; in a few seconds he came up gasping for air and brandishing the top off a garbage can.

"You and the gadget have to do better than that," he exclaimed to

Burke through chattering teeth as they helped him over the side.

They continued working the stream like a bird dog while the boat was allowed to move gradually backward down the river. In the next hour they had three more false alarms from, respectively, a discarded license plate, an old pie tin, and a metal STOP sign. It began to rain harder, and a cold wind sprang up out of the northeast.

"I dunno if we're going to do any good or not," Frank said dejectedly. "There's a lot of trash down there. Maybe those clowns never threw the plaque into the river at all."

"Hold it!" Burke interrupted. "Move back to the right a bit, Dan."

As Dan maneuvered the boat according to Burke's instructions, Frank punched around on the bottom with a long pole at the point where the depth finder was returning a hard echo.

"Well, it could be the plaque—or a thousand other things," he finally said as he crossed his arms and grabbed the bottom of his sweat shirt.

A few seconds later he went over the side and was gone for what seemed a long time. Then a strong arm shot up out of the water beside the boat, and the hand brandished the missing plaque as though it were Excalibur! A gleeful shout went up from the boys on the bank who had stuck faithfully with them all the while.

As the boat headed for the bank, the three passengers had forgotten all about the cold and the rain and the mud. Success was theirs! The "enemy" had been vanquished! They were savoring the wise words of Emerson:

"Success in your work, the finding of a better method, the better understanding that insures the better performing is hat and coat, is food and wine, is fire and horse and holiday! At least I find that any success in my work has the effect on my spirits of all these." ❑

Dan and Burke is based on a storyline created in 1954 by John Frye, W9EGV. The boys are the sons of John's original characters, Carl and Jerry.

John Frye is no longer with us. But while he was alive, John was an avid Amateur Radio operator who wrote about young people—for young people.

It's doubtful that anyone could make John's stories more interesting or improve on his words. We'll settle for giving them a 1990s twist.

If you would like to learn more about becoming an Amateur, or helping a young person become an Amateur, write to the National Amateur Radio Association, PO Box 598, Redmond, WA 98073-0598 or call #1-800-468-2426.

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NARA REVIEWS MORSE ACADEMY

Morse Academy has been called the "Cadillac" of Morse learning and speed-building programs. That's not too far off the mark. An advantage of a computer course is that generation of code can be set to random transmitted character or text, while the contents of a cassette course may eventually be memorized.

***Morse Academy* is completely user programmable!** The student can select the character speed, character learning sequence, Farnsworth spacing, frequency tone, test duration, random code groups, text—even weighting! This feature allows the student to select more vowels and commonly used letters, or simply a random selection.

The menu selections are practically self-explanatory:

Code Learning - this associates the sight of an individual character with its sound and keyboard position.

Proficiency Sessions - gives practice hand-copying Morse code—or using the keyboard.

Morse Keyboard Tutor - associates character sounds with keyboard position using groups of letters.

Receiving Game - is a fun way to learn ear-to-hand character recognition using single Morse characters.

Endurance Trials - practices Morse characters in groups

Keyboard Function - allows editing, saving and loading text and sends it at selectable speeds for practice or making cassette tapes.

An unusual feature of *Morse Academy* is the "history" weighting. This automatically keeps track of your errors and gives you more practice on your most missed characters! You can even start your practice at a slow speed and increase progressively to a faster speed. A calibration feature permits you to accurately adjust the program to your microprocessor speed. The pre-adjusted default settings appear to be just about ideal, however. Oh yes, *Morse Academy* has on-line help files.

Morse Academy works with all monochrome or color monitors and printers. It took a couple of years for Joe Speroni, AH0A, to write and optimize *Morse Academy* and he continues to improve it. The latest version, which NARA delivers, now supports sound output via the PC's sound chip, the Disnes Sound Source and ADLIB/Sound Blaster compatible music card. The quality of the music cards is good enough to produce commercial quality code test tapes.

The cost for *Morse Academy* has been purposely kept low to help beginners learn the code. It is only $9.95 plus $1.50 shipping/handling and comes complete with a 39-page manual that may be printed out from the 5-1/4" 360K IBM-compatible disk.

Morse Academy is in stock and can be obtained by calling NARA at 1-800-GOT-2-HAM.

HOT TIPS

REWARD—REWARD—REWARD

Our humble editor, Don Stoner, W6TNS, claims that it was he who coined the term "OSCAR" (Orbital Satellite Carrying Amateur Radio) back in the late 1950s. Unfortunately, he can't prove it, which makes him the subject of numerous "sure-uh huh" and "I'll bet" snide remarks. Don says the term first appeared in one of his numerous articles in *CQ* or *Popular Electronics* magazines.

In an effort to keep his reputation unsullied and to dispell the skeptics, we're offering a reward. Can you find the reference where Don gave the birds the name? If you are first to send us a copy of the article, **we'll give you a free one-year membership** to the National Amateur Radio Association.

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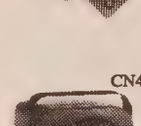

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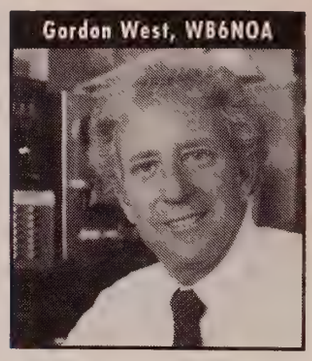


Starting Out On Simplex

by Gordon West, WB6NOA

You will probably be surprised how far your simplex transmission will go.

The Kenwood TH-78A goes into the simplex mode with a push of a button. (See ad on the back cover of this publication.)

WHEN YOUR NEW license arrives, you'll probably want to start out on the popular 2-meter band first. There are more Amateur Radio operators on 2 meters than any other band, regardless of license class. Everything happens on 2 meters!

As a newcomer to ham radio, there is plenty to learn from seasoned operators who have been using the airwaves for years. In order to "blend in" with the crowd, you will want to ease yourself onto the airwaves by starting out communicating over short range. You would want to start your first radio communications on the air over simplex, and then graduate up to repeater operation.

Any new ham will stumble over their call sign for the first couple of days, or forget to push the mike button while talking, or something silly like getting some of the terminology wrong. It's much better to do that with a ham buddy on a one-on-one basis rather than "goofing up" all over the city on a repeater.

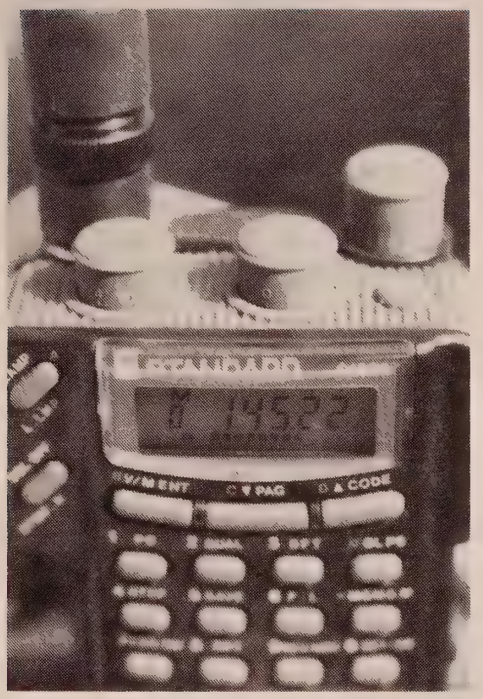
Here are the most popular 2-meter simplex frequencies to program in on your new handheld or mobile 2-meter transceiver: 147.585 MHz 147.570 MHz, 147.510 MHz, 147.450 MHz, 146.580 MHz, 146.520 MHz (the national simplex frequency), 146.460 MHz, and 144.330 MHz, Southern California Radio School simplex.

A great spot for your first transmission is the national simplex frequency of 146.520 MHz. Hundreds of mobile hams and base stations monitor this frequency, and will be more than happy to give you your first contact. Select this frequency by keyboard entry or dial knob selection.

The Icom IC-2SRA shows 144.330 MHz simplex, another simplex frequency to get started on.

Before you transmit, double check that your transceiver is set for the simplex mode. On simplex, you are transmitting and receiving on the same frequency. Your display should **not** show a small minus sign or a small plus sign in the window. If it does, you are **not** set on simplex.

To switch out of the repeater



The LCD bar graph below the frequency display indicates a medium strengh incoming signal.

duplex plus or minus indicator mode, push the "dup," plus or minus sign on the keypad until the plus or minus symbols disappear. On some sets, simplex is noted by a little tiny "S" on the screen.

▼

Simplex operating is fun!

When you think you are all dialed up for simplex, press the push-to-talk button when the frequency is clear. Press it for just a second, and watch the readout. Does it jump to another frequency? If so, you are **not** in simplex mode. But if it stays on the same frequency as you are receiving, such as 146.520 MHz, then you are all set for your first simplex contact.

Wait an additional 30 seconds to make sure that the frequency is clear, and then press the push-to-talk and say, "This is (call sign) on the air for the first time, and standing by for a call." In a few seconds, you should have a response. Write down the other station's call sign, and get started with a QSO. Be sure to leave at least three seconds between their transmission and your start-up to allow other stations to break in. Identify your station every 10 minutes, just as you would if you were operating through an actual repeater.

You will probably be surprised how far your simplex transmission will go. It's quite possible to talk from a handheld to a base station over 20 miles away. A handheld with an outside home antenna might talk to another base station, on simplex, more than 40 miles away. And power output doesn't make much difference—simplex range is best achieved by a good antenna system, up high.

So start out on simplex, and get your feet nice and wet on this mode before you step into repeater operation. **Simplex operating is fun!**

73 from Gordon, WB6NOA ❑

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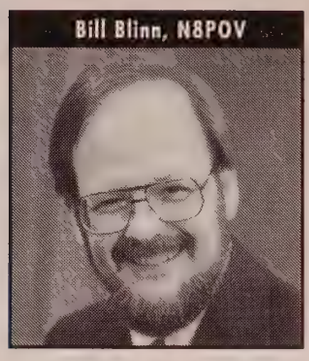
HOT TIPS

Do You Want to be a Ham in Herndon, Virginia?

If you live in the Herndon, VA or surrounding area, and are interested in becoming a ham, be sure to contact Michael E. Weber, WB8RDN, Educational Coordinator for the Herndon Repeater Group. They sponsor a large Novice/Technician training class each fall. It has been so successful they may do it more often. Drop Mike a line to determine when the next class will be presented at: 113 Evergreen St., Sterling, VA 20164.

Challenger Space Shuttle Commemorative

The Challenger Junior High School ARC will operate KI6YG on **Thursday, January 28, 1993,** from San Diego, California to commemorate the **Challenger Space Shuttle tragedy,** occurring on this date seven years ago. Operation will be on 14.270, 21.270 and 28.270 from 1500 to 2400 UTC. For a special QSL card, please send your QSL and SASE to Frank Forrester, Challenger JHS ARC, 10810 Parkdale Ave., San Diego, CA 92126. For more information, contact Frank Forrester, KI6YG, the Science and Technology Teacher or call him at (619) 586-7001, Ext. 250.


Bill Blinn, N8POV

Is "No Business" Good Business?

by Bill Blinn, N8POV

NO BUSINESS. THAT'S what the Federal Communications Commission said about Amateur Radio back in 1983. "Since then," says Personal Radio Bureau's (PRB) Management Analyst William Cross, "Amateurs keep asking us to define the word 'no.'"

That's why an amendment to Part 97 of the Commission's Rules is working its way through the bureaucratic process in Washington. The Commission adopted the rule in June of 1992 and released it for comment on July 2, 1992. Comments were due by October 1 and replies to comments due last December 1. What now?

Nobody knows when the rule will become effective. Because FCC Commissioners are appointed by the President, the Commission is understandably in a state of flux. Still there is little doubt that the proposal will be adopted and put into service—probably during 1993.

The 1983 "no business" rule, according to Cross, makes these kinds of communications illegal:

* Net reports destined for the ARRL's *QST* magazine.

* Administrative nets for marathons.

* Asking your spouse to stop by the store for some milk on the way home.

* Having a repeater broadcast a message about the time and location of a pizza party or hamfest.

But listen to Amateur frequencies and you'll hear these kinds of communications regularly. Apparently the ARRL has taken the position that the rules should be modified to match current operating practices.

MAYBE IT'S TIME FOR A CHANGE

The FCC received petitions from Michael Reynolds and from Henry Ruh (on behalf of *Amateur Television Quarterly* magazine). It also received a long letter from the ARRL that was pointedly *not* called a petition. In the Commission's view, however, the ARRL's letter was a petition and has been treated as such.

> . . . we need to determine how we'll handle our new privileges and whether business on the air is good business for Amateur Radio.

In fact, the amendment makes extensive use of ARRL recommendations contained in the "letter."

Today Part 97.113 keeps us from "ordering a pizza" (the standard question on VEC tests). It prohibits many activities, some of which are borderline public service activities. The proposed rule continues the current negative wording of the current version. Cross says anything "not specifically prohibited would be permitted." When the proposed rule is adopted, we'll find very few acts forbidden. Some of those that remain verboten are:

* *Communications for hire or material compensation,* except for the control operator of a station who may be paid for operating the station as part of classroom instruction. The ARRL also continues to insure the operation of W1AW by including language that describes W1AW's operation and allows stations to operate in that manner.

* Communications in which the station licensee or control operator have a *pecuniary interest* (except for "swap nets," that are specifically permitted).

* *Music,* communications intended to facilitate a criminal act, codes, ciphers, indecent or profane words, and deceptive messages, signals, or identification.

* Communications on a regular basis that would reasonably be furnished through other radio services.

* *Broadcasting* or one-way communications, newsgathering (except when directly related to the immediate safety of human life or protection of property).

* *Re-transmission* of signals from

any radio station except propagation and weather forecast information originating from U.S. Government stations and communications between NASA's space shuttles and Earth stations (with prior approval).

* Re-transmission of signals from other Amateur Radio operators, except for repeaters.

GOOD OR BAD?

The amendment says its goal is "not. . . to inhibit Amateur operators from using the service frequencies in the manner they believe best suited to their purposes." But even the ARRL admits officially that the change could increase the potential for exploitation and abuse of our allocated frequencies.

Some Amateurs have said the proposed change is the first step in what they see as another grab by commercial interests for Amateur Radio's frequencies. "This has been a noncommercial service from the beginning," one ham told me. "We're going to change it and, in a few years, somebody at the FCC is going to say, 'This is no longer the service it once was.' And we'll lose more of our spectrum."

PRB Management Analyst Bill Cross, a ham himself, takes issue with the conspiracy theory—but he is concerned that the changes could be detrimental to Amateur Radio. "This is not a proposal that comes from the Commission," says Cross.

The ARRL likes to point out that Amateur Radio is "self regulating," 14.313 Mhz notwithstanding. Is there any reason to feel that self-regulation will be any better when it comes to deciding individually what's permitted and what's not?

WHAT MIGHT BE ALLOWED

Let's say you and a group of your ham friends are members of the same political party. At election time you'd like to help get out the vote. One person will remain at party headquarters to take radio calls from people who need a ride to the polls. The rest of you will pick people up, take them to vote, and return them to their homes.

Today that would flatly be **illegal**. Cross says there couldn't be much argument that such an activity would be a "public service." The beneficiary would be the political party, so the activity would be prohibited. Under the proposed regulation, it might be permitted—depending on your, and the FCC's, interpretation of the term "regular basis."

The only exception would be, according to Cross, "If the driver is a taxi driver working for hire."

The ARRL describes "regular basis" in terms of the Rose Bowl Parade. Even though it's an annual event, the Rose Bowl Parade by definition is "not on a regular basis." The definition considers a daily event to be "on a regular basis," but leaves events that occur weekly, monthly, or quarterly open to an individual Amateur's interpretation.

COMMENTS ARE MIXED

FCC officials say the comments received to date have been "mixed." Some Amateurs are concerned that the guidelines are so broad that nothing would be prohibited. The result they say, would be a radical and unwanted change in the Amateur Service that would displace personal communications.

Others say "public service" is very broad and Amateurs should be permitted to use the allocated frequencies for anything that has the potential for good.

Many of the comments ask for more precise definitions and guidelines. The ARRL went so far as to ask the FCC to make two lists: 1) allowed and 2) prohibited. But Cross says "I'm not sure we have the insight to do that. Instead of saying one group is alright and another one isn't, our solution in 1983 was 'no business.'"

"What the rule comes down to," says Cross, is that "every Amateur must decide what's right and what's wrong." And the time to decide is now. The changes are coming, so we need to determine how we'll handle our new privileges—and whether business on the air is good business for Amateur Radio.

73 from Bill, N8POV ❑

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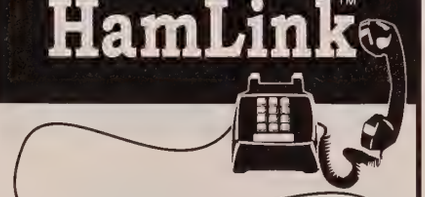

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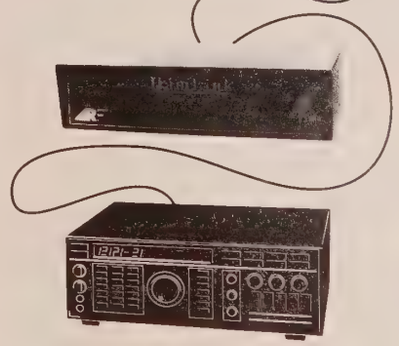

ARE

Amateur Radio Engineering, Inc.
P.O. Box 169
Redmond, WA 98073
(206) 882-2837

Traffic Handling? Ya Gotta Be Crazy!

by NARA Staff

IT'S TRUE, IT REALLY IS; a certain insensibility to reality is prevalent amongst those who choose to originate, relay, and deliver formal message traffic by the hundreds and thousands each month for other Amateurs, and for the public as well.

Really, now, what *other* possibility could there be to explain why a licensed radio Amateur would elect to spend several hours each day, hunched over in front of his equipment, trying to eke out a signature, or the last word of the text perhaps, in a series of messages from a Florida disaster site, destined for unheard-of places, and unknown people all over the world?

What additional likelihood could there be for a sailor on board the US Navy's aircraft carrier, U.S.S. John F. Kennedy, to spend 12 hours a day—in addition to his already-cruel work load—handling Amateur Radio messages to-and-from his 6000 shipmates, during the Gulf war?

Yup—absolutely bonkers. No other excuses.

Well, crazy like a fox, maybe. We at NARA wonder. Could it be—is there a possibility? Perhaps, just maybe, newcomers to the exciting world of Amateur Radio traffic handling share a common bond with old timers to the hobby. And—perhaps more importantly—an understanding of why we're all here?

Why *are* we here, anyway? What's the meaning of life? Well, life as we Amateurs know it is very much determined by the rules under which we operate. And in truth, the biggest reason that we're allowed the millions of frequencies that we have—even as neophytes to this wonderful hobby—can be found in the very beginning of the FCC Rules, Part 97. under "basis and purpose." Those of you who have just recently taken (and passed, we're sure!) your Novice or Technician class exams, will no doubt remember these purposes quite clearly. There's very good reason for them being an integral part of the exam process:

Newcomers to the exciting world of Amateur Radio traffic handling share a common bond with old timers to the hobby.

A. Recognition and enhancement of the value of the Amateur Service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.

B. Continuation and extension of the Amateur's proven ability to contribute to the advancement of the radio art.

C. Encouragement and improvement of the Amateur Service through rules that provide for advancing skills in both the communication and technical phases of the art.

D. Expansion of the existing reservoir within the Amateur Radio service of trained operators, technicians, and electronics experts.

E. Continuation and extension of the Amateur's unique ability to enhance international goodwill.

We hope that the very first reason for our continued success as Amateurs isn't lost on you. If there's *any* chance of that, please go back and read "A" listed above. Then ask yourself which operating aspect of Amateur Radio best satisfies that goal, and in fact, meets the ambitions of all five of the above purposes of the Amateur Radio Service. Welcome to formal message traffic handling!

The maneuvering of written message traffic hither-and-yon by Amateur Radio goes back a number of decades. We won't bore you with historical cobwebs, (quite frankly, NARA is much more prone to emphasizing the high exhilaration levels that are available to hi-tech traffic handlers of the 1990s), but a couple of the tinier cobwebs are certainly worth mentioning briefly.

First, the big-Daddy of all Amateur

Radio organizations—the American Radio Relay League (ARRL), (did you catch that key word in their name?) was actually formed in the early days of this century by a gent who realized that getting a message from point A to point B quite often required point C, and perhaps even D, to make it happen. That certainly hasn't changed much in the 75 years since then! Oh, we might have millions of *very* different frequencies on which to provide this type of service to the public. And yes, we do in fact have some absolutely incredible satellite and terrestrial-based networks to assist us. But the ability of Amateurs to find novel and effective ways to relay our traffic is basically the same now as then.

Secondly, the formality, the rigid *structure* of it all if you will, didn't just happen one day. There are solid and valid reasons why traffic handling is as organized and patterned as it is today. And much of that is the result of forward-thinking individuals who—while they didn't necessarily know it then—put into place back in the first part of this century procedures, policies, and methodologies that allow us to serve ourselves, the public, and the desires of the FCC in what you'll soon learn to be some *very* effective ways.

You can be a part of it all. Quite easily, actually, and it doesn't matter what your favorite mode or band is, or whether you're a newcomer or an old-timer to the Amateur Radio Service. If old-style Morse code is your cup of tea, fine. If automation via computers and satellite networks really turns your starter motor, that's wonderful as well. As is everything in between.

In the next issue of the *Amateur Radio Communicator*, we'll discuss in further detail the various modes, bands, and methods of traffic handling that make it so flexible, and easy to integrate into *your* daily life schedule. For now, though, we invite you to read the column that accompanies this article. It will show you how to obtain free information on traffic handling and other forms of public service communications, via the Amateur Radio Service.

In closing of this first of a series of *Communicator* traffic-handling articles, we'd like to make it very clear that the plethora of fancy networks and even satellite relay points that are now available to Amateurs all over the world in no way means that there is less of a need for traffic handlers. Indeed, quite the opposite is true. Why? Because, as is the case with most aspects of Amateur Radio, people tend to move on to begin enjoying other pleasurable features of the hobby from time to time. And sometimes people who get good at the lower levels of the traffic-handling organization, quite often move up to higher levels where the challenges (and the rewards!) are even greater. This of course leaves gaps that *you* can fill.

. . . decide which bands and modes of operation are of interest to you so that you can begin to "give back" a little of what the Amateur Radio Service has given to you

Look at it this way. If every Net Control Station and formal traffic liaison slot within the traffic organization was successfully filled by different Amateurs, that would equate to approximately one thousand, five hundred people alone each day! Yes, traffic handlers have in fact set themselves up for a lot of work, and a lot of responsibility. Thus, they really do need your help. You can start by becoming familiar with proper traffic-handling procedures, learning where the traffic networks are in your area, and how to interface with them in the correct manner.

And finally, now is the perfect time for you to decide which bands and which modes of operation are of interest to you so that you can begin to "give back" a little of what the Amateur Radio Service has given to you—and will continue to provide to you in the way of pleasure and satisfaction, for as long as you live. ❑

Interested in learning more about traffic handling? Well, a great deal of free material is certainly available to those wishing to learn more about Amateur Radio public service communications. The American Radio Relay League, for example, publishes the *Public Service Communications Manual*, which adequately covers the inner workings of the ARRL National Traffic System, traffic handling in general, local net operating procedures, the Radio Amateur Civil Emergency Service, (RACES) and the Amateur Radio Emergency Service (ARES).

In addition, the ARRL also publishes the ARRL *Net Directory* that provides insight into where the networks can be found for your area so that you can jump right in and begin enjoying traffic handling. Of particular value to the newcomer to traffic handling, the *Net Directory* has an enormous amount of helpful training material in the back of this free publication.

To obtain a copy of either (or both) of these documents, contact the Field Services Department, ARRL HQ, at 225 Main St., Newington, CT 06111.

L E T T E R S

AND THE MEMBERSHIP GROWS

Dear Don:

For months I have been trying to find information on SAREX either before or during the missions. This information seems to be the best kept secret in Amateur Radio. Today a friend, N0TDZ, showed me the July/August issue of *The Amateur Radio Communicator* and lo and behold there was the information I had sought on page 16! Enclosed is my subscription/membership application. Many thanks. I look forward to your future issues.

Patrick M. Griffith, N0NNK

YOU'RE NEVER TOO YOUNG

Dear Don:

Enclosed please find my check for a copy of *The Ham Radio Handbook*. I'm 77-years old and retired. I am anxious to get a license. I have the *No-Code Technician Class FCC License Preparation* book. I'm a WW II vet, having served overseas with the Co E., 318th Inf. 80th Division, 3rd Army for 39 months (one of General Patton's boys).

Yours truly,

Fred E. Mikolowsky, Jr.

TEACHERS NEEDED

Dear Don:

As a member, and Public Information Officer of my radio club, I have been working to get local teachers involved in ham radio. Do your readers have any *magic* methods for getting classroom teachers involved? In this area, the club will provide support, but we all have day jobs and can't provide long-term support in person during school hours. We can help teachers get licensed and do things evenings and weekends in support of the "mission."

The closest we got to a ham club was an offer from a Jr. High Principal to have us run a ham club during a nine-week cycle of clubs. We declined when no teacher would be present with our instructor. One of our retirees would have had to handle the kids, with no school-based authority, and uncertain liability problems.

With teacher's contracts up for negotiation, maybe we need to sneak in a new step on the pay scale for those teachers with Amateur Radio licenses. Bet we'd have 180 new hams in just a few months!

73' Bob Garland, NX3S
RF Hill ARC
Perkasie, PA

AW SHUCKS!

Dear Don:

You may not remember me, but I successfully took the Codeless tests through the use of your first book and was very pleased with it. I recently ordered your *UPGRADE to General* book and just today passed the General Class theory and code exams. I think you did an *excellent* job and I appreciate the effort you put into it in order to make the theory understandable. By the way, I loved the discussion you gave regarding the history of Morse Code. I enjoy reading about the history of things and I thought you did a great job.

Take care es 73
Joe DeRose, N3KJR/AG

Dear Don:

I am mailing my check for your new *UPGRADE to General Class* book. I am sure I will enjoy it. My wife and I used *The Ham Radio Handbook*, along with other materials to get our Codeless license last July. In September we upgraded to Tech-Plus with HF privileges. We are now working on the code for General and plan to take the test at the Dallas Ham Show. Thanks for releasing the original book. We have been talking about getting licensed for years and your book was just what we needed to actually achieve it. *UPGRADE to General Class* should be a valuable resource in getting our General class license.

Thanks again,
David, N5USH and Erin, N5USI Tingler

WE'RE DOING SOMETHING RIGHT!

Dear Don:

Before I get down to business, I would like to commend you on a nice sales pitch and a well-written September/October 1992 issue of your magazine. I was pleased to see a magazine that *encourages* new hams instead of *discouraging* them by leaving them confused and left out. I find the concept of the NARA refreshing and exciting! I would like to learn more about your organization. Therefore I request a membership and a subscription to your magazine. Enclosed is a check for $10.00 to cover the cost. Thank you for your efforts.

Bruce W. McClary, KD4SAG,
Portsmouth, VA

Dear Don:

I am currently reading your publication, *"How To Get Started in Packet Radio."* I find it an exceptional guide. I am so impressed by your book that I would like to become a member of NARA. Please find enclosed my personal check for ten dollars to cover a year's dues. Good luck and keep up the good work!

Larry Makoski, N2ELN,
East Brunswick, NJ

Dear Don:

Without your help, I probably would not have gotten involved in Amateur Radio. Now I am a Technician-Plus and proud of it. I've still got a lot to learn, and look forward to upgrading my ticket to General Class. *The Amateur Radio Communicator* is an inspiration to me and I look forward to the expanded version! Keep up the good work. Please extend my subscription for another year.

Pete Bartholomey, KD4GKQ,
Jacksonville, FL

Dear Don:

Here is my membership renewal in NARA. Keep up the good work!

Steve, KD6LL

BUT WE DO "BLOW IT" OCCASIONALLY

Dear Don:

Having read the complimentary copy you so kindly sent, I am prompted to write. Our nine-year old recently received his license. However, I did not *give* it to him, he *earned* it. After studying code all

winter, followed by theory in the spring, he passed the exam, and was issued a call in the summer. What made this all possible was the help of two hams who opened their homes and gave of their time for testing. Knowing both of these men, as well as their time commitment to Amateur Radio, it is a privilege. They truly represent a spirit that was unfortunately lacking in your skeptic editorial. I can only wonder what my son, and so many others who were as fortunate to have had a similar experience, will feel when they read your comments. It is encouragement and support that will help build our hobby.

Roger Grosser, N1ITE,
Sutton, VT

Roger, I am truly sorry if you misunderstood the basic message of my editorial. I am just as proud of your son as you are and grateful to the two hams who tested him. This is what NARA is all about. But my basic message was this: Rampant cheating has been going on in this program. Because of this, there is a stigma attached to Novices who are tested outside the VEC program. This hurts a lot of people, yourself included, since I doubt there is a coordinated VE team in Sutton, Vermont. If not, it would force you to travel many miles to have your son tested. By the way, how about sending us a photo of your son? He is the future of our hobby! - Editor

160 METERS

We've gotten more correspondence on my Nov/Dec editorial than anything that has appeared in *The Amateur Radio Communicator*. A few samples follow:

Dear Don:

I think your idea to let us non-code techs have access to 160 meters is a great idea. Take it and *go*!

Myron Cherry, N5ZPB

Thanks, Myron. I guess you win some and you lose some . . .

Dear Don:

Would you please run that by me again??? I have never in my 66 years heard or read anything more idiotic—the gobbly gook that you wrote in your article (sick, in my opinion) Nov/Dec '92 the rag you call *The Radio Amateur Communicator (no, we call it The Amateur Radio Communicator - editor)*. And they say Bill Clinton is a waffler. I had a hard time keeping up with what you was trying to put across to the readers. I went to the new *1993 Callbook* and, I was not surprised to discover the class license that you hold. I think that your thinking just might be located a bit lower in your *body* than most of us. I had thought of joining your group but, after what I was able to make out of your article (sick) about No Coders on the bottom band—**No Thanks** and, I will urge all my associates to think likewise.

73 ES GOD BLESS YOU
James M. Lucas, Jr., WQ3Y

Well, God bless you too Jim. It is always a pleasure to hear from our more articulate Amateur Extra class hams. ❑

RS15 To Fly This Year

Moscow, August 15, 1992- A launch of the new Amateur satellite RS-15 is planned for early 1993. The orbit of the spacecraft will be near circular and polar with a height 2300 km and inclination of 67 degrees. The weight of the satellite is 70 kg. The satellite was built by NPO of Applied Mechanics in Krasnoyarsk, Russia. The chief constructor is V. N. Arbuzov. The satellite, RS-15, will carry the radiotechnical complex "BRTK-1111." It was designed in the Laboratory of Space Technology associated with the Tziolkowskii Museum of Cosmonautics in Kaluga, under the leadership of A. P. Papkov, UA3XWU, and club station, RS3X.

BRTK-11 consists of a linear transponder with two beacons, a bulletin board with two megabytes of memory and a command telemetry system of 64 parameters.

The working frequencies of BRTK-11 will be as follows:

Uplink passband: 145.857 MHz to 145.897 MHz

Downlink passband: 29.357 MHz to 29.397 MHz

Beacon 1: 29.398 MHz

Beacon 2: 29.353 MHz

The transponder-output power is five watts, while the beacons will run between 0.4 watt and 1.2 watts. Antennas are 1/4-wave monopoles.

The Laboratory of Aerocosmical Technics belonging to the Russian Defense and the Technical Sports Organization (ROSTO) have helped in the coordination of the satellite launch and operation. The laboratory is headed by V. S. Yamnikov, and control station RS3A. The public relations are conducted by Dr. Alexander Zaitzev, RW3DZ.

Any organizations or persons who are interested in the experimental work of RS-15 should contact Mr. V. Yamnikov at:

Laboratory of Aerocosmical Technics
ROSTO, ul. Zemlynoi Wal 46/48
Moscow 103 064 , RUSSIA

73 de Alexander Zailev, RW3DZ ❑

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RS-10/11 Satellite Passes

We've changed the format of the RS-10/11 passes this month to make them easier to understand. The accompanying listing is based on a receiving site in Olathe, Kansas, the approximately center of the U.S. The passes are those lasting 17 minutes or longer, which are those closest to Kansas.

If you live near the east coast, subtract 105 minutes from the UTC time shown. If you live near the west coast, add 105 minutes to determine when RS-10/11 will be over your location. AOS stands for "acquisition of signal" and LOS is "loss of signal." ❑

AOS Time (UTC)	LOS Time (UTC)	AOS Time (UTC)	LOS Time (UT
01 Feb 93 08:15:13	01 Feb 93 08:32:32	03 Mar 93 17:25:12	03 Mar 93 17:42:50
01 Feb 93 19:59:41	01 Feb 93 20:17:14	04 Mar 93 04:25:05	04 Mar 93 04:42:43
02 Feb 93 06:59:31	02 Feb 93 07:17:10	04 Mar 93 16:09:49	04 Mar 93 16:27:07
02 Feb 93 20:29:40	02 Feb 93 20:47:22	05 Mar 93 03:09:35	05 Mar 93 03:26:44
03 Feb 93 07:29:33	03 Feb 93 07:47:25	05 Mar 93 16:39:28	05 Mar 93 16:57:21
04 Feb 93 07:59:49	04 Feb 93 08:17:00	06 Mar 93 03:39:30	06 Mar 93 03:57:18
04 Feb 93 19:44:12	04 Feb 93 20:01:50	06 Mar 93 17:09:48	06 Mar 93 17:27:20
05 Feb 93 06:44:04	05 Feb 93 07:01:48	07 Mar 93 04:09:39	07 Mar 93 04:27:11
05 Feb 93 20:14:16	05 Feb 93 20:31:56	07 Mar 93 15:54:14	07 Mar 93 16:11:42
06 Feb 93 07:14:07	06 Feb 93 07:31:58	08 Mar 93 02:54:05	08 Mar 93 03:11:22
07 Feb 93 19:28:42	07 Feb 93 19:46:25	08 Mar 93 16:24:00	08 Mar 93 16:41:54
08 Feb 93 06:28:37	08 Feb 93 06:46:25	09 Mar 93 03:24:02	09 Mar 93 03:41:50
08 Feb 93 19:58:53	08 Feb 93 20:16:29	09 Mar 93 16:54:26	09 Mar 93 17:11:51
09 Feb 93 06:58:42	09 Feb 93 07:16:29	10 Mar 93 03:54:13	10 Mar 93 04:11:37
09 Feb 93 18:43:39	09 Feb 93 19:00:43	10 Mar 93 15:38:41	10 Mar 93 15:56:16
10 Feb 93 05:43:17	10 Feb 93 06:00:21	11 Mar 93 02:38:36	11 Mar 93 02:55:59
10 Feb 93 19:13:14	10 Feb 93 19:31:00	11 Mar 93 16:08:32	11 Mar 93 16:26:25
11 Feb 93 06:13:10	11 Feb 93 06:31:01	12 Mar 93 03:08:34	12 Mar 93 03:26:21
11 Feb 93 19:43:30	11 Feb 93 20:01:01	12 Mar 93 16:39:04	12 Mar 93 16:56:20
12 Feb 93 06:43:17	12 Feb 93 07:00:59	13 Mar 93 03:38:47	13 Mar 93 03:56:03
12 Feb 93 18:28:05	12 Feb 93 18:45:20	13 Mar 93 15:23:08	13 Mar 93 15:40:49
13 Feb 93 05:27:48	13 Feb 93 05:45:02	14 Mar 93 02:23:06	14 Mar 93 02:40:35
13 Feb 93 18:57:46	13 Feb 93 19:15:34	14 Mar 93 15:53:05	14 Mar 93 16:10:57
14 Feb 93 05:57:43	14 Feb 93 06:15:36	15 Mar 93 02:53:06	15 Mar 93 03:10:52
14 Feb 93 19:28:08	14 Feb 93 19:45:33	15 Mar 93 16:23:43	15 Mar 93 16:40:49
15 Feb 93 06:27:52	15 Feb 93 06:45:28	16 Mar 93 03:23:21	16 Mar 93 03:40:27
15 Feb 93 18:12:32	15 Feb 93 18:29:56	16 Mar 93 15:07:36	16 Mar 93 15:25:22
16 Feb 93 05:12:19	16 Feb 93 05:29:42	17 Mar 93 02:07:36	17 Mar 93 02:25:10
16 Feb 93 18:42:19	16 Feb 93 19:00:08	17 Mar 93 15:37:39	17 Mar 93 15:55:28
17 Feb 93 05:42:16	17 Feb 93 06:00:10	18 Mar 93 02:37:38	18 Mar 93 02:55:21
17 Feb 93 19:12:46	17 Feb 93 19:30:05	19 Mar 93 14:52:05	19 Mar 93 15:09:55
18 Feb 93 06:12:28	18 Feb 93 06:29:56	20 Mar 93 01:52:07	20 Mar 93 02:09:44
18 Feb 93 17:57:00	18 Feb 93 18:14:32	20 Mar 93 15:22:13	20 Mar 93 15:39:58
19 Feb 93 04:56:50	19 Feb 93 05:14:21	21 Mar 93 02:22:11	21 Mar 93 02:39:49
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21 Feb 93 17:41:28	21 Feb 93 17:59:07	24 Mar 93 02:06:43	24 Mar 93 02:24:16
22 Feb 93 04:41:22	22 Feb 93 04:58:58	24 Mar 93 13:51:26	24 Mar 93 14:08:44
22 Feb 93 18:11:26	22 Feb 93 18:29:14	25 Mar 93 00:51:14	25 Mar 93 01:08:15
23 Feb 93 05:11:23	23 Feb 93 05:29:14	25 Mar 93 14:21:04	25 Mar 93 14:38:58
23 Feb 93 18:42:05	23 Feb 93 18:59:07	26 Mar 93 01:21:08	26 Mar 93 01:38:49
24 Feb 93 05:41:39	24 Feb 93 05:58:49	26 Mar 93 14:51:24	26 Mar 93 15:08:56
24 Feb 93 17:25:57	24 Feb 93 17:43:41	27 Mar 93 01:51:16	27 Mar 93 02:08:43
25 Feb 93 04:25:54	25 Feb 93 04:43:35	27 Mar 93 13:35:51	27 Mar 93 13:53:17
25 Feb 93 17:56:01	25 Feb 93 18:13:46	28 Mar 93 00:35:43	28 Mar 93 00:52:52
26 Feb 93 04:55:57	26 Feb 93 05:13:45	28 Mar 93 14:05:35	28 Mar 93 14:23:28
27 Feb 93 17:10:27	27 Feb 93 17:28:15	29 Mar 93 01:05:38	29 Mar 93 01:23:20
28 Feb 93 04:10:26	28 Feb 93 04:28:10	29 Mar 93 14:36:00	29 Mar 93 14:53:25
28 Feb 93 17:40:36	28 Feb 93 17:58:18	30 Mar 93 01:35:48	30 Mar 93 01:53:08
01 Mar 93 04:40:31	01 Mar 93 04:58:14	30 Mar 93 13:20:17	30 Mar 93 13:37:49
01 Mar 93 16:25:23	01 Mar 93 16:42:32	31 Mar 93 00:20:11	31 Mar 93 00:37:28
02 Mar 93 16:54:57	02 Mar 93 17:12:48	31 Mar 93 13:50:06	31 Mar 93 14:07:58
03 Mar 93 03:54:58	03 Mar 93 04:12:45		

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Join the National Amateur Radio Association

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Who Should Belong to the National Amateur Radio Association?

- Anyone interested in obtaining an Amateur Radio license
- New Amateur Radio operators of all classes
- Public and private school teachers who want to introduce their students to Amateur Radio
- Beginning Novice and Technician class Amateurs
- Elmers who want to assist beginners
- All Amateurs concerned about the future of the Amateur Radio Service

What Will You Gain when You Join NARA and Receive the *Communicator*?

1. Knowledge to help Novice and Technicians get the most from the Amateur Radio Service
2. You will help insure a solid future for the Amateur Radio Service and its frequencies
3. The knowledge that *you* will be helping others become involved in Amateur Radio.

This means an exciting future for you as an Amateur Radio operator!

Here's What You'll Find in the *Communicator!*

- Help passing the Amateur Technician Class exam
- Erecting your first antenna, propagation and more
- Different types of Amateur communications
- The latest details on rules and regulations
- Repercussions that government regulation changes will have on the future of Amateur Radio
- The latest news on proposed changes to the Amateur Radio Service
- News of interest to Novice and Technician operators
- Help upgrading your license class
- News and developments of particular interest to Novice and Technician class hams
- Pictures and news about other Novices and Technicians
- Hot Tips - news you need as an Amateur

NARA is the only national organization devoted to representing Novice and Technician class Amateurs!

What's NARA Doing?

The goals of NARA are to:

- Publicize Amateur Radio to the general public
- Get more young people involved in our hobby
- Prevent confiscation of Amateur spectrum and obtain additional allocations for Novices and Technicians
- Represent the interests of Novice and Technician class operators

Recently, Amateur Radio lost part of the 220-MHz band and, in some areas of the country, is in the process of *losing access* to another band (900 MHz).

NARA is striving to get more people involved in the Amateur Service so we can increase activity and retain our remaining Amateur bands.

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HOW DID I GET THIS MAGAZINE?

ONE OF THE WAYS WE CAN TELL THE WORLD ABOUT the goals and ambitions of the National Amateur Radio Association is to supply complimentary copies. We send about 10,000 pieces to newly licensed hams. This magazine is also mailed to a select list of people who might be interested in becoming Amateurs. We also send approximately 10,000 copies to NARA members and prominent people in Amateur Radio.

If your mailing label does not include a NARA membership number, this may be your last or only copy of *The Amateur Radio Communicator*. We would like to continue providing you with this informative publication, but we can only do so if you are a member of NARA. For those interested in becoming a ham, or who are newly licensed, a membership in NARA represents an outstanding bargain. A membership, which includes a subscription to *The Amateur Radio Communicator*, is only $10.00 per year.

Check the mailing label for your membership number. If you don't see one, look at the NARA advertisement and read the benefits of becoming a member of this fast-growing organization. We need your support and so does ham radio. Help us get it "going and growing!"

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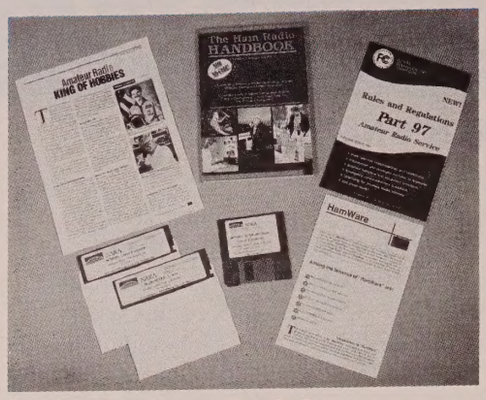


Pass the New Codeless Technician Test!

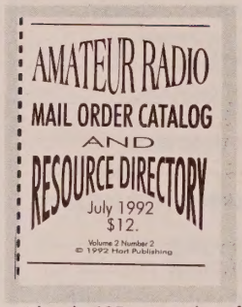
Everything you need to pass the new codeless Technician Class exam! The **NARA Codeless Technician Package** includes:

- *The Ham Radio Handbook*, the 200+page study guide that guarantees you'll pass the test or your money back!
- HamWare software for testing your knowledge
- FCC Amateur Rules and Regulations book
- Bonus Morse code training program (IBM) 0 to 25wpm
- Complete list of Contact Volunteer Examiners
- *King of Hobbies* publication, a special introduction to Amateur radio

The NARA Codeless Technician Package (IBM) is just $29.95 (3.00 S&H) #P110.

Having Trouble with Code?

The **Morse Academy,** IBM software, actually teaches all 43 required code characters and then steps you up through the Amateur Extra level using sophisticated computer aided instruction techniques. Adjustable tone, standard or Farnsworth spacing. Sends text or randomly generated characters—plus an on-disk manual! (5¼" disk) ***WAS* $14.95, *NOW ONLY* $9.95 ($1.50 S&H)** #S410.



NEW 1993!

Amateur Radio Mail Order Catalog And Resource Directory

This highly valuable reference directory contains over 1,500 entries, in 185 categories of Amateur radio resources! You'll find names, address' and phone numbers on everything from Alternative energy to Zener diodes. Including parts and equipment, kits and keyers, even personalized hats, mugs and license plates. There is even an extensive listing of radio clubs worldwide, international radio magazines, and over 100 free catalogs available on the market.

If you're looking for that hard-to-find antenna or the perfect gift, it's in this 236-page Amateur radio resource catalog. A must for every Amateur to own! **Amateur Radio Mail Order Catalog and Resource Directory is only $14.95 ($3.00 S&H)** #B660.

HamWare™ Testing Software

The **HamWare,** IBM compatible (5¼" and 3½" disks) testing software, provides all the practice you need to get your first license or to upgrade. Drawings and diagrams appear automatically on screen along with the appropriate questions, and there's even a practice mode, complete with hints, answers and help screens. There's even a handy on-screen scientific calculator. Your choices are mouse or keyboard selectable. As a bonus, each disk includes a copy of **Morse** software for learning Morse code.

- HamWare Nov/Tech Classes w/Morse #S210
- HamWare General Class w/Morse #S211
- HamWare Advanced Class w/Morse #S212
- HamWare Extra Class w/Morse #S213

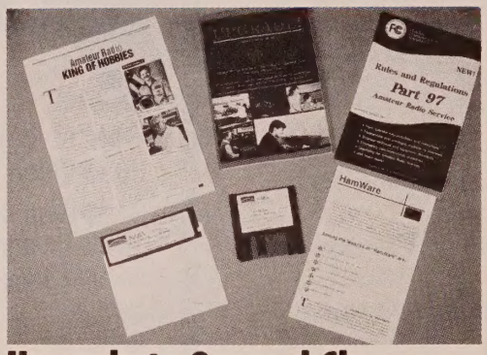
HamWare is available at Amateur Radio dealers or directly from NARA. License classes are sold individually. Each class is only **$14.95 ($2.00 S&H).**

NARA Amateur Training Package

Start with your Novice or no-code Technician license and go "all the way" to Extra class with this excellent IBM compatible training package that includes:

- HamWare Novice/Technician Classes w/Morse
- HamWare General Class w/Morse
- HamWare Advanced Class w/Morse
- HamWare Extra Class w/Morse
- 60-page *FCC Rules and Regulations, Part 97*
- *Amateur Radio—King of Hobbies*
- An extensive list of Contact Volunteer Examiners.

Save by ordering the **NARA Amateur Training Package.** This entire package (5¼" and 3½" disks) is only **$32.95 ($3.00 S&H)** #S220.



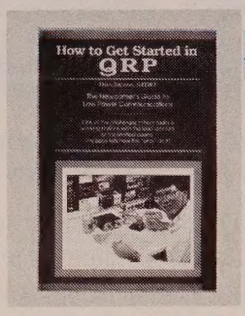
Upgrade to General Class with the NARA UPGRADE Package

NARA has put together all the essential tools you'll need to upgrade to General class. This value-packed offer includes:

- *UPGRADE! to General Class* by W6TNS
- HamWare General Class IBM (5¼" and 3½" disk) testing software w/Morse
- 60-page *FCC Rules and Regulations, Part 97*
- *Amateur Radio—King of Hobbies*
- An extensive list of Contact Volunteer Examiners

The **NARA Upgrade Package** is available at Amateur Radio equipment dealers or directly from NARA for only **$29.95 ($3.00 S&H)** #P240.

A FREE issue of *The Amateur Radio Communicator* will be mailed to you at a later date when you order any NARA product!



NEW!

Introduction to QRP!

NARA does it again with its ***How To Get Started in QRP*** book. QRP (meaning low-power operation using five watts or less) offers a unique and exciting challenge for today's ham. Written by Dave Ingram, K4TWJ, "*QRP*" covers an overview of QRP, accessories, operating tips, power sources, homebrew, clubs, awards and more. With today's technology and equipment, working the world with QRP could be the ultimate challenge! ***How To Get Started in QRP*** is available at all major ham radio stores or directly from NARA for only **$9.95 ($2.00 S&H)** #B690.

MacHam™ Testing Software

MacHam is one of the most useful series of ham radio programs written for the "Mac." All required circuit diagrams are displayed with the question on the screen. If the test is printed, the diagrams are included.

The tests can be taken on screen, by element or by chapter, with options of immediate or end-test scoring. Printouts create exact VE style exams, with question pool numbers, correct and blank answer sheets.

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Pass the Codeless Technician Test with the MacHam™ Education Package

The **MacHam Education Package** includes:

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- *Ham Radio Handbook,* by Donald Stoner, W6TNS
- Ham radio *FCC Rules and Regulations, Part 97*
- *Amateur Radio—King of Hobbies*
- An extensive list of Contact Volunteer Examiners

Order direct from NARA today. **The MacHam Education Package** is only **$49.95 ($3.00 S&H)** #P320.

Upgrade to General with the MacHam™ Upgrade Package

If you want to upgrade to General Class, you need the **MacHam Upgrade Package** which includes:

- MacHam General Class software
- *UPGRADE!* book by Donald L. Stoner, W6TNS
- Ham radio *FCC Rules and Regulations, Part 97*
- *Amateur Radio—King of Hobbies*
- An extensive list of Contact Volunteer Examiners

The **MacHam Upgrade Package** is only **$44.95 ($3.00 S&H)** #P340.

Learn the Code with these Outstanding Cassette Tapes!

These cassette tapes will give you the practice you need to pass your code exams. Each set contains two cassette tapes. Each set sold separately.

- Novice/Technician Class 0 to 5wpm #T710.
- General Class 5 to 14wpm #T720.
- Extra Class 12 to 24wpm #T730.

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AVAILABLE FROM NARA

The Ham Radio Handbook

By Donald L. Stoner, W6TNS, is the leading book for anyone wishing to earn the new code-free Technician license. Includes every question plus the multiple-choice answers.

The Ham Radio Handbook is the only test manual that explains in detail why the correct answer is correct. Includes simple and easy-to-understand theory along with many photos and illustrations.There are ten chapters covering each subelement. Sample tests are given at the end of every chapter with a list of correct answers at the back of the book.Guaranteed to provide all the information needed to get your ham radio license or your money will be refunded. ***The Ham Radio Handbook*** is only **$9.95 ($2.00 S&H)** #B610.

FCC Rules and Regulations

The FCC, Rules and Regulations Part 97, covers the guidelines and rules of the Amateur Radio service. This 60+ page book is an excellent reference for every class of license; a resource book no ham shack should be without! ***Rules and Regulations, Part 97, Amateur Radio Service*** is only **$4.95 ($1.00 S&H)** #B640.

All About Ham Radio

This is the book that Don Stoner wishes he had written. Harry Helms, AA6FW, wrote this book in a manner that can be understood by everyone from young to old alike. Although not keyed directly to the question pools, it provides all the information you need to know to become a Technician Class Amateur.

Over 290 pages of jam-packed information including Hams And Their Radios, Customs, Habits And Other Good Stuff, Single Sideband, Ham Radio Meets the Personal Computer, Folklore, and much more.

For a book that covers so many different aspects of the Amateur radio hobby **All About Ham Radio is a steal at only $19.95 (3.00 S&H)** #B680.

Order Today!

UPGRADE! To The Tech-Plus and General Classes!

UPGRADE! *to General Class* by W6TNS shows "no-code" hams how easy it is to upgrade to the Tech-Plus or General Class license!

UPGRADE! has nine chapters covering each subelement of the General Class exam. All multiple-choice questions and answers for the General Class exam are included. Tips and special hints for learning the code and increasing your speed are also included!

UPGRADE! is available from Amateur Radio stores, or direct from NARA for **$9.95 ($2.00 S&H)** #B620.

Play It Up! With NARA's New Videotapes

Explore Amateur Radio through exciting videotapes! Directed by some of the best-known names in ham radio, these videotapes are the perfect addition to every ham's collection. Choose from the following:

Getting Started In Ham Radio. Covers the early stages of ham radio including station layouts, safety, choosing and setting up equipment and repeaters. By *CQ Videos*, **only $19.95 ($3.00 S&H).**

Getting Started On Amateur Satellites. A "how-to" guide for the newcomer wanting to work the world through Amateur satellites. Discusses equipment, DXing and more. By *CQ Videos*, **$19.95 ($3.00 S&H).**

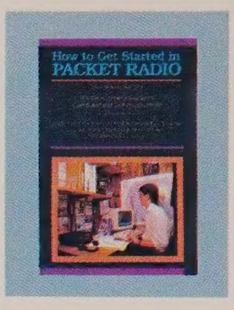
Getting Started in Packet Radio. A "how-to" guide to setting up a computer-to-computer station, getting on the air, QSOs, and operating packet effectively. By *CQ Videos*, **only $19.95 ($3.00 S&H).**

Getting Started in DXing. Successful DXers offer their tips on getting started, proper operating skills, snaring the rare ones, basic equipment and more. By *CQ Videos*, **only $19.95 ($3.00 S&H).**

Reading, 'Riting and Radio! Great for teachers and instructors, educator Carole Perry, WB2MGP, with her students and ham radio classes for children shows how beneficial and exciting ham radio is in school for teaching geography, world affairs, current events, math and more. **Only $19.95 ($3.00 S&H).**

CQ Field Day! Designed to help hams who want to set up their equipment in the great outdoors, this tape takes you to the award-winning 22A Field Day station. It shows you everything from setting up to packing up an outdoor radio station. **Only $19.95 ($3.00 S&H).**

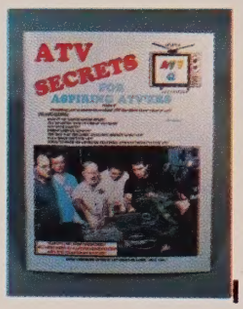
Ham Class. Well-known instructor, Gordon West, WB6NOA, helps prepare students and instructors to set up a ham class. The tape contains live classroom demonstrations and tips on setting up classes or training seminars. **Only $19.95 ($3.00 S&H).**



NEW!

Packet Radio For Beginners

NARA has done it again with ***How To Get Started In Packet Radio*** written by well-known author Dave Ingram, K4TWJ. This informative new book explains the practical side of packet radio in a simple-to-understand manner. It begins with a non-technical description of packet radio, followed by chapters including *Getting Started, Setting Up Your Station, Operating Packet to Networking* and *HF Operation.* There is even a *Packet Radio Equipment Survey* and an appendix that includes circuits for interfacing equipment! Get ***How To Get Started in Packet Radio*** **today for only $9.95 ($2.00 S&H).** #B670



ATV Secrets For Aspiring ATV'ers

ATV Secrets For Aspiring ATV'ers, written by Henry Ruh, KB9FO, contains everything you wanted to know about Amateur Television (ATV). All ham licensees can participate in ATV—*even those with the new no-code license!* Amateur TV is fun and exciting. Take your home video productions and find new audiences, make new friends and get more enjoyment from your equipment. Hams should be *seen* as well as heard!

ATV Secrets is available through all major Amateur Radio equipment stores, or you can order from NARA for only **$7.98 WAS $9.98 ($2.00 S&H)** #B630.

The FCC Question Pools—

Each booklet contains all the questions and answers for each license class. Does not contain explanations. Order your booklet by license class.

- Novice and Technician classes together (all the questions for the new code-free Technician class license) **$4.95 (S&H $1.50)** #B650.
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- **Alphanumeric message paging**
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  The TH-78A offers full-duplex cross-band operation and can receive two frequencies simultaneously—even on the same band (VHF+VHF or UHF+UHF). The single-band transceivers feature dual-band receive—the TH-28A also receives on the 440MHz band, and the TH-48A also receives on the 144MHz band—thus enabling semi-duplex cross-band operations (TH-28A↔TH-48A).
- **Multi-function memory channels**
  The TH-78A has 50 memory channels (expandable to 250 with the ME-1 option), while the TH-28A and TH-48A each have 40 channels (expandable to 240 with the ME-1 option).
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  You can choose from 8 different types of scan for each band, plus 2 scan stop modes—carrier-operated and time-operated.
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  The DTSS function allows DTMF access to the transceiver: the squelch is opened only when the appropriate 3-digit code has been received. The pager responds to a 7-digit DTMF tone group, indicating the caller's identity on the display.
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- **Alphanumeric message paging**
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- **Battery-saving features**
  Auto power-off and auto battery saver functions help maximize operating hours.
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TH-78A/28A/48A

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